REMARKS

I. Summary of the Examiner's Action

A. Claim Rejections

As set forth in paragraph 2 on page 3 of the February 25 Office Action, claims 1 – 2, 8 – 14 and 20 – 24 stand rejected under 35 U.S.C. § 102(b) as being anticipated by United States Patent No. 6,320,173 B1 to Vock (hereinafter "Vock" or "the Vock patent").

As set forth in paragraph 5 on page 7 of the February 25 Office Action, claims 1 – 6 and 13 – 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over United States Patent No. 6,654,056 B1 to Perregaux (hereinafter "Perregaux" or "the Perregaux patent") in view of United States Patent No. 6,654,056 B1 to Ang (hereinafter "Ang" or "the Ang patent")

As set forth in paragraph 6 on page 11 of the February 25 Office Action, claims 1 – 2, 7, 13 and 19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over United States Patent No. 6,596,979 B2 to Hou (hereinafter "Hou" or "the Hou patent") in view of the Ang patent.

These rejections are respectfully disagreed with, and are traversed below.

II. Interview

Applicants' Representative conducted an interview in the case on May 14, 2009. During the interview, Applicants' Representative explained to the Examiner that the references relied upon in the obviousness rejections only concerned imaging operations and not image analysis operations, as is required by the independent claims in the case. Applicants' Representative later presented a proposed response the case, and the Examiner agreed that the arguments presented therein were persuasive regarding the obviousness rejections. The Examiner agreed to withdraw the obviousness rejections. In a later teleconference that occurred on May 22, 2009 the Examiner indicated that further arguments regarding the anticipation rejection presented by Applicants in a revised proposed response required a new search.

III. Applicants' Response

A. Claim Rejections

1. Rejection of Claims 1 – 2, 8 – 14 and 20 – 24 under 35 U.S.C. § 102(b)

Applicants reproduce claim 1 here as a convenience to the Examiner (emphasis added):

1. A method for locating a position of a feature in a scene, comprising the steps of

forming an image of the feature using a segmented array having a plurality of array subelements each having a linear

dimension, wherein each of the array subelements has an output signal; and

cooperatively analyzing the output signals from at least two spatially adjacent array subelements

to establish a data set reflective of an extent to which output signals responsive to the image of the feature are produced from exactly one or from more than one of the adjacent array subelements, and

to reach a conclusion from the data set as to a location of the image of the feature on the segmented array with an accuracy of less than the linear dimension of an array subelement when the output signal is produced from more than one of the adjacent array subelements.

Applicants respectively submit that Vock is seen neither to describe nor suggest the emphasized subject matter of claim 1.

Applicants have argued in previous responses that the Examiner has not set forth a proper anticipation rejection in that each and every limitation is not found in the Vock reference. Where Applicants believe that the Examiner's rejection is particularly deficient, Applicants have identified that the relied-upon and remaining portions of Vock simply do not describe or suggest the subject matter of the independent claims. The Applicants then asked that the Examiner identify with greater particularity where the missing portions of claim 1 are to be found in Vock. The Examiner has not identified in this current office action where the missing subject matter of claim 1 is to be found in Vock.

This is not surprising, because as discussed in Applicants' previous response, Vock discussed a situation where an image of a golf ball is spread across two detectors, but despite this opening did not go forward and describe or suggest Applicants' specific solution. Repeating this portion of Applicants' response, Vock does mention one instance where a golf ball is about the size of an IFOV of a detector, but the situation is identified as a problem and Vock shows no appreciation for Applicants' solution to the problem as demonstrated at column 13, lines 7 – 20 (emphasis added):

> "The analysis above neglects certain key factors, such as: diffraction, ball motion, ball images that cross between two detectors, simultaneous imaging of two balls crossing within the field of regard, optical blur and defocus, and similar effects. At image 142d, for example, the ball image and pixel dimensions are approximately equal. At this special condition, neither technique works particularly well. Nevertheless, there are acceptable solutions to these problems: a combination of the above techniques can be used, the distancing data can be ignored for selected failure conditions, diffraction effects can be included by summing adjacent detectors, and estimation routines can 'bridge' certain data by considering past data, future expected data, and certain physical constraints."

Applicants respectfully note that the emphasized portion of Vock specifically mentions the situation where the ball image and pixel dimensions are about the same size and cross between two detectors, but shows no appreciation for Applicants' method "to establish a data set reflective of an extent to which output signals responsive to the image of the feature are produced from exactly one or from more than one of the adjacent array

subelements, and to reach a conclusion from the data set as to a location of the image of the feature on the segmented array with an accuracy of less than the linear dimension of an array subelement when the output signal is produced from more than one of the adjacent array subelements" as is required by claim 1.

This portion of Vock is the only portion of Vock that is arguably concerned with the problems that are of interest to Applicants. It suggests several approaches, but none of them describe or suggest the subject matter of claim 1. For example, Vock suggests that one possible approach be that certain failure conditions (e.g., where an image overlaps two adjacent detectors) be *ignored.* Applicants' invention does *not* ignore a so-called "failure" condition. Instead, it seeks to develop useful information concerning the position of an image when such a "failure" condition is encountered. In another possible approach, Vock suggests that the outputs of adjacent detectors be *summed.* Adding the output of two adjacent detectors would *lessen* the resolution of imaging operations, not increase them as in the case of Applicants' invention, which seeks to determine the position of an image "with an accuracy of *less than the linear dimension of an array subelement* when the output signal is produced from more than one of the adjacent array subelements". In fact, summation would *decrease* the effective resolution since the position of an image would be known to an accuracy *greater than* the linear dimension of the detectors whose outputs are being summed. Finally, the last approach of Vock is devoid of implementation detail. Exactly how a combination of Vock's suggested

approaches would operate, and what they would accomplish, is not described in sufficient detail to determine whether the subject matter of claim 1 is described or suggested.

In view of the foregoing the conclusion reached by the Examiner set forth here is insupportable:

> "In response to applicant's arguments that Vock neither describes nor suggests the limitations emphasized on page 13, lines 9 – 17 of the remarks, the examiner disagrees. Vock clearly describes in col. 3, lines 13 – 25 imaging an object (golf ball) at high frame rates 'frame rates will capture a golf ball at each frame and at adjacent pixels frame-to-frame' and subsequently analyzing the image of the golf ball frame-by-frame 'when the composite image is analyzed . . . making distance determination relatively easy.' Vock clearly describes analyzing adjacent pixel data (particularly representing the golf ball) at least among frames to determine the golf balls position at a particular time. In addition, Vock also describes in col. 7, lines 33 – 40, utilizing certain digital electronics to perform tracking and detecting a moving object (golf ball) within a given range using the data from selected pixels from each frame to determine object motion, location, flux intensity and distance."

With respect to the first one-third of this argument by the Examiner, it is strictly unavailing because it is too general to concern the specific subject matter of claim 1. With respect to the second one-third of this argument the Examiner makes an assertion that image analysis among frames is performed but provides no citation. Applicants have already identified the most relevant portions for Examiner and demonstrated how the portions are deficient. If the Examiner has other portions of Vock in mind, Applicants are waiting for the Examiner to identify them. Regarding the last one-third of the

argument, the Examiner is again relying on a general description of imaging and tracking equipment to conclude that the specific subject matter of claim 1 is anticipated.

Applicants therefore respectfully request that the rejection of claim 1 on this basis be withdrawn. Applicants also request that the rejection of independent claims 13 and 24 be withdrawn for reasons similar to those set forth above with respect to claim 1, and for reasons having to do with their independently-recited features. Applicants further request that the rejection of dependent claims 2, 8 – 12, 14 and 20 – 23 be withdrawn both because these claims depend from allowable claims and because of the independently-recited features of these claims.

2. Rejections under 35 U.S.C. § 103(a)

Applicants respectfully submit that Ang is not seen to remedy the now-admitted deficiencies of the Perregaux and Hou patents. The Examiner is construing read-out functions performed by scanners as "cooperatively analyzing the output signals from at least two spatially adjacent array subelements..." The Examiner is confusing *imaging* operations with *image analysis* operations. *Imaging operations* are sufficient to create data that can be reproduced on a display or a sheet of paper. No image analysis is necessary since the imaging data itself is sufficient to reproduce an image. *Image analysis operations*, on the other hand, are used, for example to identify where an object is in space for targeting or tracking purposes. Image analysis operations operate on samples created by imaging operations. The data created during image analysis is not necessary to reproduce an image.

The read-out operations of a two-dimensional imager performing *imaging operations* preserve the relative positions of picture elements ("pixels") as must be well-known by the Examiner. It is not necessary to analyze adjacent pixels to accurately reproduce an image created by a two-dimensional imager – the read-out operation that transfers the pixel samples from the imager to memory already does this. Accordingly, it strains credulity when the Examiner states at page 7, line 20 – page 8, line 4 that:

> "For example, the microprocessing functions performed by the 'CMOS active pixel color linear image sensor' in FIG. 3 of Ang (U.S. Patent No. 6,507,011 B2) such a line control/readout logic (320), line store select logic (33), timing control logic (370) and analog mux (350). It would have been obvious to one skilled in the art to provide a device capable of cooperatively analyzing adjacent array subelements and determining feature locations for the purpose of reconstructing (from memory) the imaged features for image reproduction."

One skilled in the art would conclude that, at best, this portion of Ang described hardware that is capable of performing *imaging operations*. On skilled in the art would not conclude that this portion describes hardware capable of performing *image analysis operations*. Although Applicants' understand that claim terminology and other prosecution material are typically given their broadest reasonable construction, the construction nonetheless has to be reasonable and accord with how one skilled in the art would understand the materials. One skilled in the art would know that the operations in Ang referred to by the Examiner have as their purpose the goal of keeping sampled pixels from a two-dimensional imager separate from one another so that an accurate image is

reproduced. One skilled in the art would not assume that this required some image analysis as in the case of Applicants' invention. In the first instance the desire is to keep the pixels separate from one another!

Applicants therefore respectfully request that the rejection of claim 1 on this basis be withdrawn. Applicants also request that the rejection of independent claims 13 and 24 be withdrawn for reasons similar to those set forth above with respect to claim 1, and for reasons having to do with their independently-recited features. Applicants further request that the rejection of dependent claims 2 - 7 and 14 - 19 be withdrawn both because these claims depend from allowable claims and because of the independently-recited features of these claims.

IV. Conclusion

The Applicant submits that in light of the foregoing remarks the application is now in condition for allowance. Applicant therefore respectfully requests that the outstanding rejections be withdrawn and that the case be passed to issuance.

Respectfully submitted,

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Date

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